Notice

This information is being provided to assist the permitee with the development of the Interim Optimization Plan by identifying the minimum information required to assess process performance and the potential for improvement. Since the assessment process will vary with the size and complexity of the existing treatment facility, it is important to recognize that additional areas may need to be addressed within the report. The majority of systems in Virginia are activated sludge treatment systems. The information being provided is focused on these systems. In the event a treatment system other than activated sludge is being evaluated (i.e. Trickling Filter, RBC, etc.) the preparer should try to follow the outline as close as possible. Nothing in this document is intended to limit the content of the Interim Optimization Plan. The writer should include all information deemed necessary to adequately assess the system capability to achieve improved nutrient reductions through operational adjustments.

INTERIM OPTIMIZATION PLAN (IOP)

Purpose of Report: To evaluate the existing facility's ability to remove nutrients and to identify any operational and/or process adjustments that can be utilized to reduce nutrient levels (Total Nitrogen and Total Phosphorus) in the final effluent discharge of the existing facility.

The report should include any information the preparer deems necessary to evaluate the current performance and determine what options are available to improve nutrient removal through process control adjustments (i.e. D.O. , Alkalinity, SRT, Chemical addition, etc.) and/or minor process modifications (i.e. creation of anoxic/anaerobic conditions, baffle installation, recycle piping/pumping, mixers, etc.)

Current Treatment Process Performance Evaluation:

- ***Facility Description:***

  Should provide a description of the existing treatment facility including process description, units in service/available, and condition of treatment components. ***Information pertaining to design versus actual hydraulic/organic loading rates should be included as well as a flow diagram showing all available units and current configuration.***

Current mode of operation

System flexibility for mode/operational level adjustment

Current Nutrient Removal status

Description of process

Design flows

Average daily
Hydraulic peak
Maximum wet weather

Actual flows

Average daily
Maximum daily dry weather
Maximum daily wet weather

Loading for each system component

- Hydraulic Loading/Detention Times
- Organic Loading
- Surface Loading (where applicable)
- Solids Loading (where applicable)

Return & Waste System

- Type/equipment description
- Number available/in-service
- Capacity
- Control
- Flexibility

Aeration

- Type/equipment description
- Units available/in-service
- Capacity
- Control

Chemical Feed

- Type/equipment description
- Purpose
- Capacity

Solids Handling

- Description of process
- Capacity
- Hydraulic & organic loading
- Sidestream flow rates
- Sidestream organics/solids loading

- ***Waste characterization and Operational performance:***

Whenever possible waste characterization and current operational performance data should be submitted in electronic format (i.e. Excel spreadsheet). This will facilitate the review process**.** ***Parameters included below represent the minimum data recommended to assess the current nutrient removal ability; the report is not limited to examples shown.***

<u>Waste characterization</u>

Provide detailed information on the characteristics of wastewater currently received and discharged by the treatment system. It should include laboratory monitoring data for the parameters listed below for plant and process influent, effluent and sidestream flows: This section should also identify and describe any other characteristics that may potentially impact the facility's capability to implement/optimize nutrient removal (i.e. significant industrial contributions, septage handling, etc).

In the event data is unavailable, the section should provide the range of values used during the system evaluation and the basis for any assumed values.

Parameters
COD
BOD5
CBOD5
TSS
Ammonia
TKN
Nitrite/Nitrate
Total Nitrogen
Orthophosphate
Total Phosphorus
Alkalinity
pH
D.O.
Temperature

Operational performance

This section should include detailed information on current operations, control levels, operational strategies and performance with respect to conventional pollutants and nutrient removal. It should also identify any limiting factors that impact plant staff capability to make process adjustments (i.e. lack of aeration capacity, insufficient solids handling capacity, etc.). It should also include detailed information on current process control monitoring and operational levels.

Current Operational Control Testing Frequency & Ranges:

Parameters
D.O.
Alkalinity
pH
Temperature
SRT
MLSS
MLVSS
Return rates
Waste rates
SVI

Other Operational Factors

The report should also address other operational considerations that have a direct impact on the system capability to establish and/or maintain optimum nutrient removal. These include but are not limited to:

Infiltration/Inflow:

The effect of Inflow/Infiltration (I/I) should be evaluated to determine the impact on the plants process performance and ability

Plant Staffing:

The staffing level and technical capability should be evaluated to determine if additional staffing will be required and/or what training is needed to implement adjusted operational strategies.

Maintenance:

Current maintenance capabilities should be evaluated to identify adjustments that may be required to ensure operational continuity.

- ***Nutrient Removal Options:***

  Actions Taken Already

  Describe and evaluate any process adjustments and/or modification the plant staff has already taken to increase nutrient reduction in the current system (including a description of the impact on plant performance and operation)

  Evaluation of Options

  This section should identify all options (operational and/or operational with minimal process modification) considered for achieving and/or improving system nutrient removal capability. For each identified option, provide an evaluation including a description of the required changes, the potential impact on effluent nutrient levels, overall plant performance, and operational costs. The section should also identify any potential limiting factors associated with implementation of the option (i.e. solids handling, lack of capacity, impact on facility budgeting, etc.)

  Recommendation(s)

  The report should recommend which option(s) should be implemented.

  ☞ *Note: Some recommendations may involve equipment and /or process changes that will require an engineering review.*

- ***Implementation:***

  This section should include the requirements associated with implementing the recommended option(s). At a minimum, this section should:

  Recommend necessary process adjustments and provide a suggested schedule for implementation
  Provide recommendations for initial process control monitoring (what, where and how often) and when possible, initial target levels for key process control parameters.
  Identify implementation costs (i.e. chemical, electrical, mechanical, additional monitoring, etc.)
  Review potential problems (i.e. wet weather events, sludge quality and handling, etc.) and provide recommendations for minimizing their impact on implementation
  Provide additional staff development needs.